

# **Lake Way Sulphate of Potash Project**

**Salt Lake Potash Pty Ltd**

**Section 38 Referral – Supporting Information**

**September 2019**

**Document:**

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<b>Synopsis:</b>	This document provides supporting information for the referral of the Sulphate of Potash project at Lake Way under Part IV of the <i>Environmental Protection Act 1986</i> .

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## Table of Contents

	<b>Abbreviations and Acronyms</b> .....	iv
	Part A: Proposal Description .....	6
1	Short Summary of the Proposal .....	6
2	Project Description .....	7
	<b>2.1 Works excluded from the Referral</b> .....	8
	<b>2.1.1 Lake Way Demonstration Plant Proposal CMS17578</b> .....	8
	<b>2.1.2 West Creek Groundwater Borefield</b> .....	8
	<b>2.1.3 Southern Borefield</b> .....	10
	<b>2.1.4 Exploration Activities</b> .....	10
	<b>2.2 Site Plan and Tenure</b> .....	12
	<b>2.3 Proposed Infrastructure</b> .....	13
	<b>2.3.1 Brine abstraction</b> .....	13
	<b>2.3.2 Evaporation and Processing</b> .....	15
	<b>2.3.3 Process Waste</b> .....	15
	<b>2.3.4 Supporting Infrastructure</b> .....	17
	<b>2.3.5 Additional infrastructure</b> .....	17
3	Ground Disturbance .....	18
	<b>3.1 Alignment with the Lake Way Demonstration Plant Referral</b> .....	18
	Part B: Environmental Impacts .....	22
4	Environmental Impact Assessment and Permitting .....	22
	<b>4.1 EPA Principles</b> .....	22
	<b>4.2 Regulatory framework</b> .....	24
5	Identification and Assessment of Environmental Factors .....	25
	<b>5.1 Identification of factors</b> .....	25
	<b>5.2 Preliminary Assessment of Significant Environmental Factors</b> .....	31
	<b>5.2.1 Flora and Vegetation</b> .....	32
	<b>5.2.2 Inland Waters</b> .....	34
	<b>5.2.3 Social Surroundings</b> .....	36
6	Cumulative Impact Assessment.....	37
7	Conclusion.....	38
8	References .....	39

## List of Tables

Table 1-1 Summary of the Proposal.....	6
Table 3-1: Location and proposed extent of physical and operational elements .....	18
Table 3-2 Cumulative Disturbance Footprint.....	19
Table 4-1: Principles of Environmental Management at Lake Way. ....	22
Table 4-2: List of Regulatory Approvals Required for the Project.....	24
Table 5-1: Key Environmental Factors for the Lake Way SOP Project.....	25
Table 5-2: Summary of Assessment of Environmental Factors for the Lake Way Project. ....	26

## List of Figures

Figure 2-1 Demonstration Plant Indicative Infrastructure footprint.....	11
Figure 2-2 Typical Trench Cross section.....	13
Figure 2-3 Paleochannel Bore Conceptual Design .....	14
Figure 2-4: Indicative Process Flowsheet .....	16
Figure 3-1: Lake Way Sulphate of Potash Project Development Envelope.....	20
Figure 3-2: Lake Way Sulphate of Potash Indicative Infrastructure.....	21

## List of Appendices

Appendix A: Lake Way Paleochannel Test Pumping Summary .....	41
Appendix B: Lake Way <i>Tecticornia</i> Literature Review Gap Analysis.....	42
Appendix C: Targeted Night Parrot Survey: Lake Way .....	43
Appendix D: Lake Way Aquatic invertebrate Review.....	44
Appendix E: Lake Way Acid Sulphate Soil Investigation .....	45
Appendix F: Environmental Management and Monitoring Plan .....	46

## Abbreviations and Acronyms

Term	Definition
AEP	Annual Exceedance Probability
ASS	Acid Sulphate Soil
Blackham	Blackham Resources Limited
DBCA	Department of Biodiversity, Conservation and Attractions
DMIRS	Department of Mines, Industry Regulation and Safety
DoW	Department of Water
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environment Regulation
EMMP	Environmental Management and Monitoring Plan
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Western Australian Environmental Protection Authority
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FIFO	Fly-in Fly-out
GLOS	Groundwater Licence Operating Strategy
GLpa	gigalitres per annum
H <sub>2</sub> SO <sub>4</sub>	Sulphuric Acid
ha	hectare
HDPE	High Density Polyethylene
JORC	Joint Ore Reserves Committee
km	kilometre
ktpa	Kilotonnes per annum
LAA	Land Access Agreement
m	metre
MBO	Monosulphidic Black Ooze
MgCl <sub>2</sub>	Magnesium Chloride
mm	millimetre
MNES	Matters of National Environmental Significance
Mtpa	Million tonnes per annum
NTLA	Native Title Land Access Agreement
NUDLC	National Uniform Drillers Licensing Committee.
PEC	Priority Ecological Community
POW	Programme of Works
ROM	Run of Mine
SO <sub>4</sub>	Salt Lake Potash Limited
SOP	Sulphate of Potash
the Project	Lake Way Sulphate of Potash project

Term	Definition
TDS	Total Dissolved Solids
TEC	Threatened Ecological Community
TMPAC	Tarlku Matuwa Piarku Aboriginal Corporation

## Part A: Proposal Description

### 1 Short Summary of the Proposal

Table 1-1 Summary of the Proposal

<b>Proposal Title</b>	Lake Way Sulphate of Potash Project
<b>Proponent Name</b>	Salt Lake Potash Pty Ltd (SO4)
<b>Short Description</b>	<p>SO4 is seeking to abstract Sulphate of Potash (SOP) rich brines to produce up to 260 kilotonnes per annum (ktpa) of SOP product.</p> <p>SO4 proposes to develop and operate the Project at Lake Way, which is located approximately 25 km south of Wiluna in the Mid-West of Western Australia.</p> <p>The proposal includes:</p> <p>Evaporation ponds, brine abstraction trenches, paleochannel brine production bores, permanent brine pumps/pipework, access and infrastructure corridors and excess salt disposal areas.</p> <p>This proposal extends the lifespan of infrastructure not assessed under the Lake Way Demonstration Plant Project (CMS17578) from 5 years to approximately 20 years of operation.</p>

## 2 Project Description

The Lake Way Sulphate of Potash project (the Project) is located at Lake Way in the Goldfields region of Western Australia, approximately 25 km south of Wiluna. Salt Lake Potash Limited (SO4) holds approximately 280 km<sup>2</sup> of tenure over Lake Way, including the brine-rich paleochannel that underlies the saline playa. Blackham Resources Limited (Blackham) is the owner of the adjacent Matilda-Wiluna Gold Operation and holds tenure over approximately 90 km<sup>2</sup> at the northern end of the Lake, including the Williamson pit. SO4 has entered into a sales agreement with Blackham, whereby Blackham will transfer its existing tenure under the *Mining Act 1978* on and around Lake Way to SO4.

Investigations completed by SO4 have proven that hypersaline groundwater (brine) from salt lakes can be concentrated economically and, via solar evaporation, produce mixed potassium double salts. In early 2018, modelling of the Lake Way evaporation pathway was completed by solar evaporation consultants, Ad-Infinitum. The modelling revealed that the salts produced by solar evaporation of Lake Way brine were suitable for processing into Sulphate of Potash (SOP). The potassium harvest salts include the saline evaporites of leonite ((K<sub>2</sub>SO<sub>4</sub>)(MgSO<sub>4</sub>)), schoenite (K<sub>2</sub>Mg(SO<sub>4</sub>)<sub>2</sub>·6(H<sub>2</sub>O)) and kainite (KMg(SO<sub>4</sub>)Cl·3H<sub>2</sub>O), which are all amenable to conversion to SOP.

The Project will extract brine from the lake sediments via a combination of trenches on the Lake Way surface and deep production bores tapping into the underlying confined paleochannel aquifer. Extracted brine will be concentrated in a series of solar evaporation ponds to induce the sequential precipitation of salts, eventually producing potassium-containing salts in the harvest ponds. Harvesting is proposed to be carried out using a grader, a front-end loader and tipping trucks, which recover the salt and transfer it to the process plant for processing.

The activities and infrastructure included in this referral are: evaporation ponds, brine abstraction trenches, paleochannel production bores, permanent brine pumps/pipework, access and infrastructure corridors and excess salt disposal areas.



## **2.1 Works excluded from the Referral**

Certain elements of the overall project design have been excluded from this referral, as they have either been previously considered by the Environmental Protection Authority (EPA), or the approval pathway excludes a referral under the EP Act. The works excluded are:

1. Construction and operation of demonstration plant infrastructure;
2. Process water extraction from licenced bores within West Creek and the Southern Borefield; and
3. Exploration activities.

Further details on the works excluded from this referral and associated approvals are provided in sections 2.1.1 to 2.1.4.

### **2.1.1 Lake Way Demonstration Plant Proposal CMS17578**

The Lake Way Demonstration Plant referral was submitted to the EPA on the 8 March 2019 (CMS 17578, Figure 2-1). The referral was examined, and a decision granted for the proposal not to be assessed under Part IV of the EP Act. Following further consultation with the EPA, it was agreed that a camp facility would be included within the footprint approved for the Demonstration Plant.

Secondary approvals (e.g. Mining Proposal<sup>1</sup>, Works Approval<sup>2</sup> and Native Vegetation Clearing Permit) associated with the Demonstration Plant referral are currently under assessment by Department of Mines, Industry Regulation and Safety (DMIRS) and Department of Water and Environment Regulation (DWER). The construction and operation of the Demonstration Plant is not included in this referral.

In the expectation of a successful demonstration project, this proposal extends the operating lifespan of infrastructure referred to the EPA under the Lake Way Demonstration Plant Project (CMS17578) from 5 years to approximately 20 years of operation.

### **2.1.2 West Creek Groundwater Borefield**

The potential for environmental impacts associated with water extraction at a rate of up to 0.7 GLpa from water production bores within the West Creek bore field was previously assessed under EPA Assessment No 1819 (Wiluna uranium project - EPA report 1437, May 2012) and again under EPA Assessment No 2002 (Extension to the Wiluna uranium project – EPA report 1580, September 2016). In conducting its assessments, the EPA took into consideration the following technical studies:

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<sup>1</sup> Mining Proposal Reg ID: 80903

<sup>2</sup> Works Approval Application W6282/2019/1

- Bennelongia (2016), Independent Review, Wiluna Expansion Proposal: Assessment of Potential Impacts on Subterranean Fauna, April 2016.
- Ecologia (2016), Toro Energy Limited – Extension to the Wiluna Uranium Project Cumulative Impact Assessment, June 2016.
- Niche Environmental Services (2011), Assessment of the Flora and Vegetation at the Toro Energy Wiluna Uranium Project: Lake Way, Centipede and West Creek borefield- Appendix E to ERMP. Report prepared for Toro Energy Limited, July 2011.
- Outback Ecology (2011b), Subterranean Fauna Assessment: Appendix F to ERMP. Report prepared for Toro Energy Limited, March 2011.
- RPS Aquaterra (2010), West Creek Water Supply Groundwater modelling: Appendix G to ERMP. Report prepared for Toro Energy Limited, June 2010.
- RPS Aquaterra (2014), Summary of West Creek Borefield Modelling Results, 4 November 2014.

The EPA was also provided with an independent review by Rockwater (2011) of the hydrogeological assessment of the West Creek borefield completed by RPS in 2010, although the EPA did not specifically mention Rockwater’s independent review in its assessment report. The Rockwater review concluded that “...*the hydrogeological assessment and associated modelling has been conducted to a high standard when compared to the MDBC [Murray Darling Basin Commission] guidelines, which is the standard used by the DoW. An overall performance of 78% compliance to the performance criteria was achieved ... which is considered very good considering the medium complexity of the model and the data limitations. Generally only minor corrections or changes have been noted. The parameters used in modelling appear reasonable given the hydrogeological units involved...*”.

The EPA’s assessment report (No 1437) concluded that groundwater abstraction from the West Creek bore field at a rate of up to 0.7 GLpa could be managed in an environmentally acceptable manner.

SO4 has been granted a licence to abstract water at 0.7 GLpa from the West Creek borefield (GWL203216(2)). As the borefield is not planned to be abstracted at a greater rate than that previously assessed, the potential impacts remain as per the previous EPA assessment and can be managed under a Groundwater Licence Operating Strategy (GLOS) associated with GWL203216(2).

### **2.1.3 Southern Borefield**

As part of the sales agreement between Blackham and Salt Lake Potash, Blackham's 5C licence to abstract groundwater under the *Rights in Water and Irrigation Act 1914* for the Southern Borefield (GWL167013(3)) will be transferred to Salt Lake Potash.

The Southern borefield has been in operations since 1987, with an approved operating strategy. SO4 will continue operating in accordance with the approved operating strategy, and therefore no change in the environmental impact from this abstraction is anticipated.

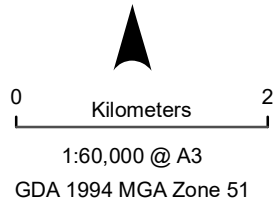
The two water licences granted for the Project allow for the abstraction of up to 1.83 GLpa of groundwater, which includes 1.13 GLpa from the Southern Borefield and 0.7 GLpa from the West Creek borefield. The allocated water abstraction quantities will meet the Projects construction and processing demands.

### **2.1.4 Exploration Activities**

Exploration drilling and test pumping of the paleochannel brine bores is required for resource definition. In addition, a temporary pipeline and associated infrastructure is to be constructed to transfer the brine produced during bore test pumping to previously constructed ponds, rather than discharging brine onto the lake surface. The test results will be used to support the application for a mining lease and to define the resource in line with the Joint Ore Reserves Committee (JORC) requirements.

The exploration drilling and test pumping of the Paleochannel bores will be completed under granted 26D licences (CAW203028(1), CAW202043(1)) and a granted 5C licence (GWL 202044(2)). DMIRS is currently assessing Programme of Work (POW) applications to commence the exploration drilling program and install associated infrastructure.

If the Lake Way SOP project does not proceed, the infrastructure built under POWs will be rehabilitated in accordance with the requirements of the *Mining Act 1978*.



**Lake Way**  
 Figure 2-1  
 Lake Way Demonstration Plant (CMS 17578)

- Legend**
- Demonstration plant indicative infrastructure
  - Part IV Demonstration Plant Development Envelope



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## 2.2 Site Plan and Tenure

SO4 has entered into a sales agreement with Blackham, whereby Blackham (held by Kimba Resources and Matilda Operations Pty Ltd) will transfer its existing tenure under the *Mining Act 1978* on and around Lake Way to SO4. The agreement also allows SO4 to establish infrastructure on other Blackham tenements, with agreed, documented processes for managing liability associated with mine rehabilitation and closure. Additional tenure applications (Mining, Miscellaneous or General Leases) will be lodged by SO4 as part of the project development.

Two pastoral leases – the Lake Way and Millbillillie pastoral stations (owned by Toro Energy Limited) underlie the Project area. SO4 continues to work with the pastoral lease holders to ensure the Project does not unreasonably affect their operations.

The Project lies within the determined Native Title Claim area of the Wiluna People (WCD2013/004), managed under the Tarlku Matuwa Piarku Aboriginal Corporation RNTBC (ICN8156) (TMPAC).

SO4 and TMPAC have entered into a Native Title Land Access Agreement (NTLA) for brine mineral exploration activities; including the development of a demonstration plant and associated infrastructure to support such activities. SO4 and TMPAC are currently negotiating a Land Access Agreement (LAA) incorporating Project Operations.

SO4 has consulted with the Traditional Owners and incorporated the outcomes of these consultations in the basis of design and implementation of the Project. This includes the identification of exclusion zones within the Project area. SO4 and TMPAC have committed to continuing to work together to minimise the Project impacts on the heritage values at Lake Way. Where impacts are unavoidable, these impacts will be assessed and managed in accordance with the LAA, cultural heritage management plan and relevant legislation (i.e. approved under the *Aboriginal Heritage Act 1972*).

## 2.3 Proposed Infrastructure

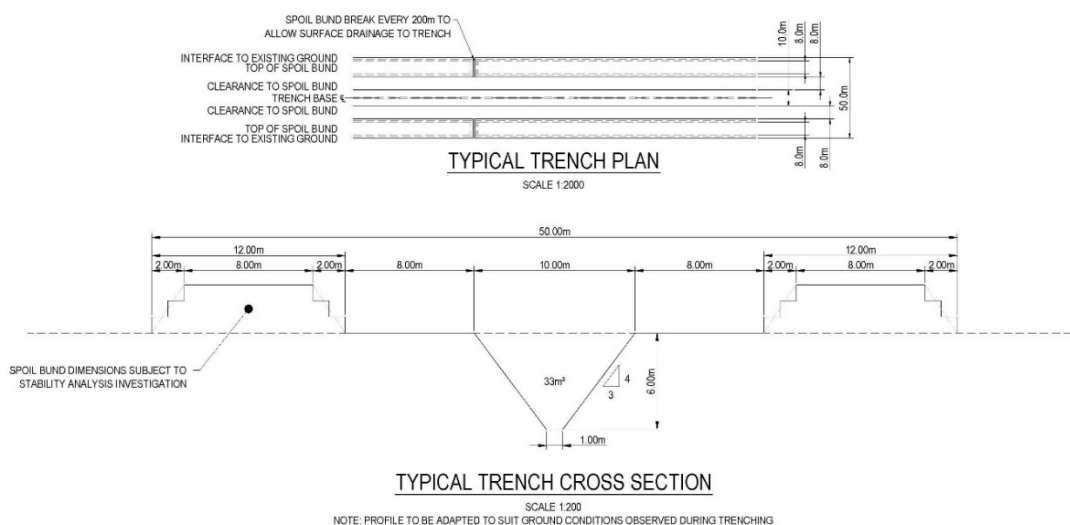
### 2.3.1 Brine abstraction

Brine will be abstracted by:

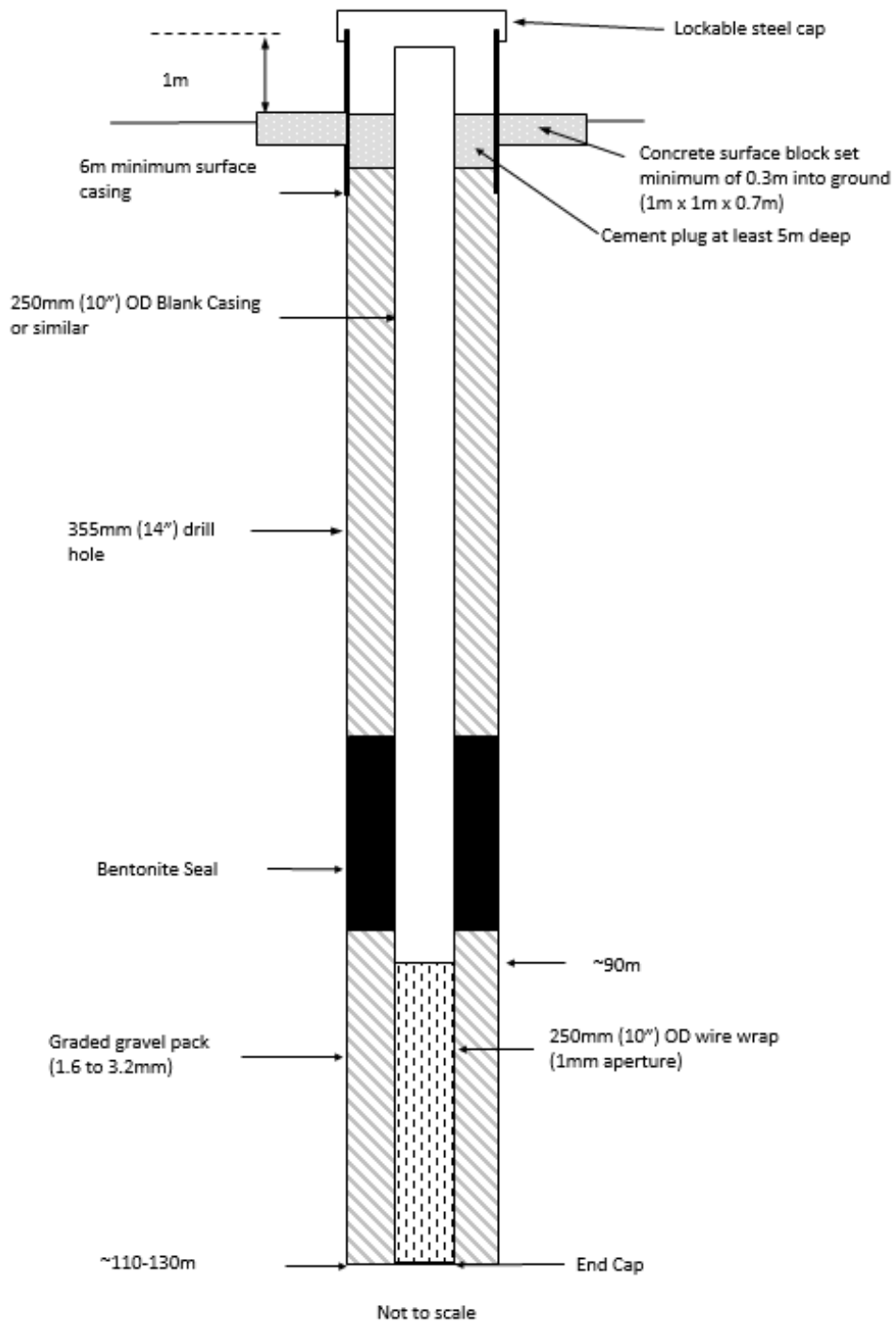
- Surface trenching to access the brine contained with the surficial lake way sediments (Figure 2-2); and
- Deep vertical bores to access brine within the paleochannel aquifer (Figure 2-3).

The shallow lakebed sediments (shallow aquifer) and the paleochannel sand units (deep aquifer) within Lake Way make up two separate aquifer units. These two aquifers are separated by the very low permeability paleochannel clays. The clays are estimated to be between 60-90m thick. Hydrogeological investigations undertaken at Lake Way have shown that there is no connection between the shallow and deep aquifer (Salt Lake Potash 2019, Appendix A). Bore construction is designed to include a slotted metal screen (1mm aperture) and blank casing from the base of the hole to the surface. A 10m bentonite seal will be emplaced above the screens within the clays to ensure that there is no connection between the aquifers within the borehole annulus. Another 5m bentonite seal and concrete cap will be emplaced at the surface to stop water inflow. These standards meet or exceed the Minimum Construction Requirements for Water bores in Australia, 3rd Ed., (NUDLC 2012).

Bores and trenches will be equipped with pumps and the brine will be pumped through pipelines to supply the evaporation ponds. Ground disturbance for brine abstraction will be limited to that needed for bores, trenches, pipes and access tracks.



**Figure 2-2 Typical Trench Cross section**



**Figure 2-3 Paleochannel Bore Conceptual Design**

### 2.3.2 Evaporation and Processing

Extracted brines are concentrated in a series of evaporation ponds to induce the sequential precipitation of salts resulting in potassium-containing salts in the harvest ponds (Figure 2-4). Brine is pumped from the trenches or paleochannel bores to the evaporation ponds where halite is salted out. The brine concentration is monitored to ensure that only halite salts are formed in the pond and potassium remains in the brine.

Following the evaporation ponds, the concentrated brine solution is pumped into the harvest ponds where the brine concentration is monitored to ensure the correct potassium salts are formed. The salts from the pond are harvested and transferred to the Run Of Mine (ROM) pad for processing. A concentrated magnesium chloride ( $MgCl_2$ ) waste product (bischofite) is contained within the harvest ponds for transfer to the bischofite pond on lake.

The process plant crushes the harvested salt to the correct size then uses reverse flotation to remove waste products. The potassium salt undergoes a conversion reaction followed by crystallisation to form SOP. The product is stockpiled at the plant site for transfer to port.

### 2.3.3 Process Waste

There are three excess salt waste streams generated by the process:

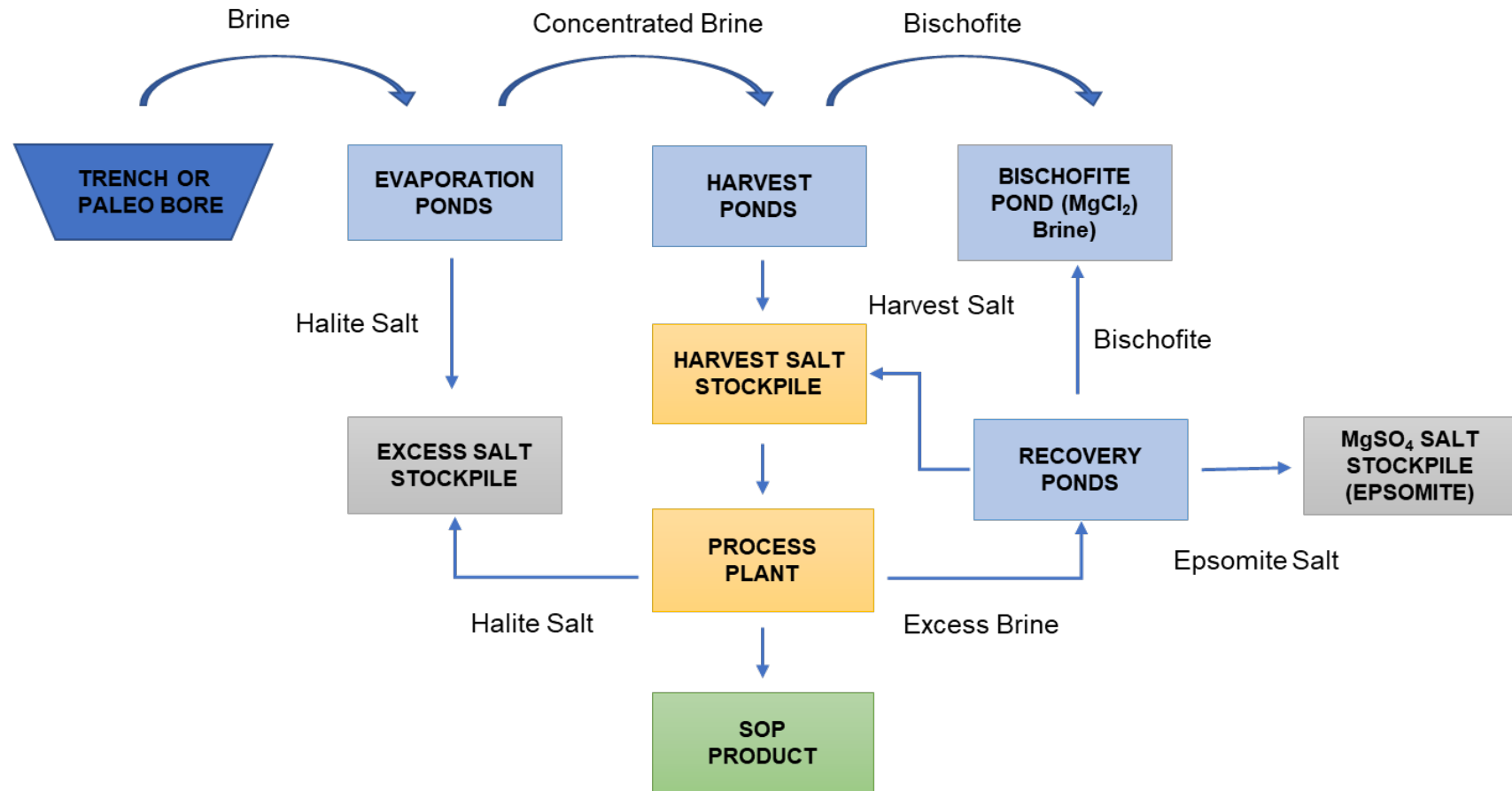
- Solid Waste 1: dewatered halite salt from the evaporation ponds and process plant flotation which is returned to the salt stockpile on lake.
- Solid waste 2: epsomite ( $MgSO_4 \cdot 7H_2O$ ) is reclaimed from the recovery pond and stockpiled for potential resale or transferred to the excess salt stockpile for disposal on lake.
- Liquid Waste: liquid bischofite, which is the remnant brine from the process plant recovery pond, which is pumped to the bischofite pond on the lake.

The halite stockpile is the largest waste stream from the processing, with an estimated 5.1 Mtpa produced per 260 ktpa of product. A footprint of 936 ha has been allowed, based on a maximum stockpile height of 18m. This height was determined based on the existing heights of islands on the lake surface.

SO4 plans to maximise the value of the excess salt waste streams by:

- Using waste halite for construction purposes for on lake infrastructure.
- Potentially selling reclaimed epsomite as a co-product to the fertiliser market or other sectors.
- Using bischofite brine as a dust suppressant on roads and causeways on lake.





**Figure 2-4: Indicative Process Flowsheet**

## **2.3.4 Supporting Infrastructure**

This section describes the supporting infrastructure required for the Project.

### **2.3.4.1 Internal Access Roads**

Internal access roads include those required to connect all of the facilities for operational, maintenance and personnel movements. These roads include access roads to the brine abstraction facilities and evaporation ponds.

### **2.3.4.2 Power Supply**

The Project power requirements will be provided by a standalone natural gas power station located near the process plant and by local diesel generators at remote locations. Natural gas will be supplied from the Goldfields Gas Pipeline, which runs along the eastern side of Lake Way; approximately 27 km from the process plant. Initially it may be necessary to use diesel generation for the project.

The gas pipeline will be owned and operated by a third party and as such the gas pipeline and associated laterals are not included as part of this referral.

### **2.3.4.3 Water Supply**

The Project will require approximately 1.64 GLpa of fresh to brackish water for processing and other ancillary uses such as potable water. SO4 currently holds water allocations totalling 1.83 GLpa under a granted 5C licence (GWL203216(2), 'West Creek Borefield') and through an agreement with Blackham to take water under Blackham's 5C licence (GWL167013(3), 'Southern Borefield').

Water abstraction under these licences and associated transfer pipelines are not included as part of this referral.

## **2.3.5 Additional infrastructure**

A fly in/fly out (FIFO) workforce will access the operations area via the existing Wiluna Airport, which is located 5 km south of the main Wiluna township.

### 3 Ground Disturbance

The estimated disturbance footprint for the project totals approximately 2,750 ha, of which approximately 2,612 ha (95%) is within the unvegetated lake. The disturbance activities taking place within the development envelope are summarised in Table 3-1.

**Table 3-1: Location and proposed extent of physical and operational elements**

Element	Location	Proposed Extent
<b>Physical Elements</b>		
Evaporation ponds, brine abstraction trenches, paleochannels bores, brine pumps /pipework, access and infrastructure corridors and excess salt disposal areas.	Figure 3-1	Disturbance of no more than 2,750 ha within the 25,010 ha Development Envelope.
<b>Operational Elements</b>		
Brine abstraction from trenches and paleochannel bores.	Figure 3-2	Abstraction of up to 30 gigalitres per annum (GLpa).
Excess salt disposal within the Development Envelope.	Figure 3-2	Disposal of no more than 5.1 Mtpa of excess salt into the excess salt area.

#### 3.1 Alignment with the Lake Way Demonstration Plant Referral

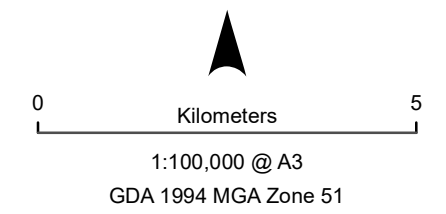
As stated in Section 2.1.1 of this document, this proposal extends the operating lifespan of infrastructure referred to the EPA under the Lake Way Demonstration Plant Project (CMS17578) from 5 years to approximately 20 years of operation.

The on-lake development envelope of the Demonstration Plant referral is encompassed by the development envelope for this referral. Therefore, there is no cumulative increase in the development envelopes. Table 3-2 provides a summary of the cumulative disturbance associated with the two referrals.

**Table 3-2 Cumulative Disturbance Footprint**

Element	Demonstration Plant	Lake Way SOP Project	Cumulative Impact
<b>Physical Elements</b>			
Evaporation ponds, brine abstraction trenches, paleochannels bores, brine pumps/pipework, access and infrastructure corridors and excess salt disposal areas.	No more than 757 ha of disturbance	Disturbance of no more than 2,750 ha	Disturbance of no more than 3,507 ha
Off-lake infrastructure <sup>3</sup> including processing plant, camp site and associated infrastructure	No more than 47 ha of disturbance	N/A	No more than 47 ha of disturbance
<b>Operational Elements</b>			
Brine abstraction from trenches and paleochannel bores.	Abstraction of up to 6 GLpa.	Abstraction of up to 30 GLpa.	Abstraction of up to 30 GLpa.
Excess salt disposal within the Salt Lake Development Envelope.	N/A	Disposal of no more than 5.1 Mtpa of excess salt into the excess salt area.	Disposal of no more than 5.1 Mtpa of excess salt into the excess salt area.
Direct disturbance to fringing <i>Tecticornia spp.</i> habitat	N/A	No greater than 50 ha direct impact to mapped <i>Tecticornia spp.</i> habitat	No greater than 50 ha direct impact to mapped <i>Tecticornia spp.</i> habitat

<sup>3</sup> Not included in this referral; previously referred under Lake Way Demonstration Plant Referral



## Lake Way

Figure 3-1  
Lake Way Sulphate of Potash Project  
Development Envelope

### Legend

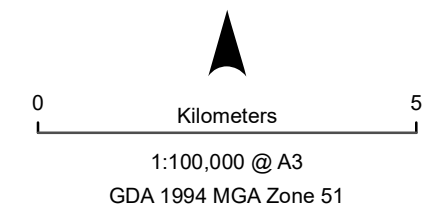
- Development Envelope



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**Lake Way**  
 Figure 3-2  
 Lake Way Sulphate of Potash Project  
 Indicative Infrastructure

- Legend**
- Indicative Infrastructure
  - Development Envelope
  - Demonstration Plant



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## Part B: Environmental Impacts

### 4 Environmental Impact Assessment and Permitting

#### 4.1 EPA Principles

The EPA has identified a set of principles for environmental management. Details of how these have been considered in the design of the Project are provided in Table 4-1.

**Table 4-1: Principles of Environmental Management at Lake Way.**

Principle	Application
<p><b>Precautionary Principle</b></p> <p>Where there are threats of serious irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>In the application of the precautionary principle, decisions should be guided by:</p> <ul style="list-style-type: none"> <li>Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment.</li> <li>An assessment of the risk-weighted consequences of various options.</li> </ul>	<p>SO4 has conducted baseline studies and associated impact assessments in a manner that supports an informed, risk-based assessment of the Lake Way proposal.</p> <p>SO4 has used historic environmental studies by others and the results of environmental monitoring by neighbouring mining operations at Lake Way to inform its appreciation of local environmental values and to guide its assessment of potential project impacts (including cumulative impacts).</p> <p>SO4 commits to the development, implementation and monitoring of measures to prevent unacceptable environmental harm or pollution associated with implementation of the Lake Way Potash Project.</p>
<p><b>Intergenerational Equity</b></p> <p>The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.</p>	<p>SO4 commits to managing those environmental factors within its control such that future adverse impacts are minimised and that, wherever possible, the quality of the environment is maintained or enhanced.</p> <p>The Mine Closure Plan will be amended for the Lake Way Sulphate of Potash Project in consultation with regulatory and traditional owner stakeholders to ensure that post mining land use is consistent with agreed stakeholder objectives.</p>
<p><b>Conservation of Biological Diversity and Ecological Integrity</b></p> <p>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>SO4 has taken into consideration the biological diversity of the lake when designing the project. This includes:</p> <ul style="list-style-type: none"> <li>Obtaining specialist input to guide the engineering process.</li> <li>Locating key infrastructure away from areas of potential environmental or cultural significance.</li> <li>Engineering with the minimum environmental impact as far as reasonably practicable.</li> </ul>

Principle	Application
<p><b>Improved Valuation, Pricing and Incentive Mechanisms</b></p> <p>Environmental factors should be included in the valuation of assets and services.</p> <p>The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement.</p> <p>The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</p> <p>Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which benefit and/or minimise costs to develop their own solutions and responses to environmental problems.</p>	<p>SO4 has worked closely with other industry in the Wiluna area to minimise the overall disturbance footprint and utilise existing infrastructure where possible. This includes the use of Blackham’s previously approved (and existing) haul road, laydown areas and borrow pits.</p> <p>SO4 maintains an Environmental Management System aligned to ISO14001. The Environmental Management System establishes documented objectives to minimise environmental impact, including procurement and contracting services.</p> <p>SO4 is currently working with relevant suppliers to obtain organic certification for its product.</p>
<p><b>Waste Minimisation</b></p> <p>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p> <p>Wastes should be managed in accordance with the following order of preference:</p> <p>Avoidance, Re-use, Recycling, Recovery, Treatment, Containment and Disposal.</p>	<p>The project has been designed incorporating the following waste minimisation considerations:</p> <ul style="list-style-type: none"> <li>• Use construction materials at source, minimising transport costs.</li> <li>• Use HDPE pipework, as this can be recycled and reused more easily than steel pipework.</li> <li>• All waste pipework to be recycled where possible.</li> <li>• Use existing infrastructure where possible.</li> <li>• Using excess salt for construction purposes on-lake e.g. infrastructure.</li> <li>• Using concentrated lake brine (MgCl<sub>2</sub>) as a dust suppressant on roads and causeway on-lake.</li> </ul>



## 4.2 Regulatory framework

Table 4-2 provides a summary of the anticipated approvals likely to be required or amended for the project, prior to the project being implemented.

**Table 4-2: List of Regulatory Approvals Required for the Project.**

Regulated Activity	Approval / Amendment Required	Legislation (Regulatory Body)
Ground disturbance, mining and processing activities	Grant of tenure	<i>Mining Act 1978 (DMIRS)</i>
Mining and ore processing	Approval to operate via project management plan.	<i>Mines Safety and Inspection Act 1994 (DMIRS)</i>
Ground disturbance, mining and processing activities	Amendment to mining proposal and mine closure plan (Reg ID: 80903)	<i>Mining Act 1978 (DMIRS)</i>
Storage and handling of dangerous goods	Dangerous Goods Licence	<i>Dangerous Goods Safety Act (2004)</i>
Groundwater and brine abstraction	Amendment to approved Brine Abstraction 5C licence (GWL 202044(2)) Approved 26D licences (CAW203028(1)) & (CAW202043(1))	<i>Rights in Water and Irrigation Act 1914 (DWER)</i>
Potash production by solar evaporation	Works approval and amendment to licence (L9208/2019/1)	<i>Environmental Protection Act 1986 – Part V (DWER)</i>
Impact to Aboriginal Site	Section 18 approval(s)	<i>Aboriginal Heritage Act 1972 (DPLH)</i>
Grant of tenure	Native Title Agreement	<i>National Native Title Act 1993</i>

## 5 Identification and Assessment of Environmental Factors

### 5.1 Identification of factors

A number of baseline surveys have been undertaken, with further detailed site investigations currently underway. The identification and assessment of environmental factors in this section were based on:

- Surveys undertaken by SO4, in addition to earlier surveys completed by Toro Energy and Blackham Resources. These historical surveys have been utilised to support the knowledge base for this project and to obtain an understanding of the potential regional impact of the project.
- Consultation with key stakeholders, including local government and traditional owners to identify areas of significance, provide understanding of environmental and heritage survey requirements and ongoing investigations.

Table 5-1 provides an assessment of the key environmental factors identified as being relevant to the Project.

**Table 5-1: Key Environmental Factors for the Lake Way SOP Project.**

Theme	Factor	Significant Factor
Sea	Benthic Communities Habitat	N/A
	Coastal Processes	N/A
	Marine Environmental Quality	N/A
	Marine Fauna	N/A
Land	Flora and Vegetation	✓
	Landforms	N/A
	Subterranean Fauna	N/A
	Terrestrial Fauna	N/A
	Terrestrial Environmental Quality	N/A
Water	Inland Waters	✓
Air	Air Quality	N/A
Human Health	Social Surrounds	✓
	Human Health	N/A

Table 5-2 summarises the reasoning behind the assessment of the key environmental factors for the Project. Information regarding each of the key environmental factors considered, including a description of the potential environmental impact and preliminary management and mitigation actions, is contained in this section.

**Table 5-2: Summary of Assessment of Environmental Factors for the Lake Way Project.**

Theme	Factor	Relevant Section of this Document	Comment
Sea	Benthic Communities Habitat	-	Not applicable as the project is not in a coastal environment; no further assessment of these factors is necessary.
	Coastal Processes	-	
	Marine Environmental Quality	-	
	Marine Fauna	-	
Land	Flora and Vegetation	5.2.1	<p>Approximately 138 ha of vegetation will be required to be disturbed as part of this proposal. Included in this disturbance footprint is a total direct impact of no greater than 50 ha to <i>Tecticornia</i> habitat.</p> <p>Direct vegetation disturbance will occur from the construction of pipelines, paleochannel bores, access tracks and trenching. The remaining area within the development envelope comprises bare lake surface. SO4 will utilise existing infrastructure and access roads as far as practicable.</p> <p>The samphire (<i>Tecticornia spp.</i>) habitat associated with Lake Way generally – and potentially including the project disturbance footprint - is known to include:</p> <ol style="list-style-type: none"> <li>1. Two priority <i>Tecticornia</i> taxa;</li> <li>2. Five new <i>Tecticornia</i> taxa;</li> <li>3. Six potentially new <i>Tecticornia</i> taxa; and</li> <li>4. Three range extension <i>Tecticornia</i> taxa.</li> </ol> <p>A gap analysis with respect to flora and vegetation has been undertaken by Botanica Environment Consultants and is included as Appendix B of this report.</p> <p>Indirect impacts may occur to fringing vegetation (such as <i>Tecticornia spp.</i>) from changes in lake hydrology, being groundwater drawdown and changes to water shadow and inundation due to on-lake infrastructure.</p> <p>Groundwater modelling has been completed to ascertain the long term cone of depression associated with brine abstraction operations. To minimise any impact to vegetation associated with the lake fringes, SO4 intends to position trenches as far as practicable away from the edge of the <i>Tecticornia spp.</i> habitat.</p>

Theme	Factor	Relevant Section of this Document	Comment
			<p>Flood modelling for a range of Annual Exceedance Probability (AEP) events has been completed over Lake Way as part of the referral for the demonstration plant. This model will be updated as part of the assessment of impacts of the full scale project.</p> <p>The Project is not located within Environmentally Sensitive Areas, Schedule 1 Areas, or DBCA managed land or within areas mapped as Threatened Ecological Communities.</p> <p>Based on the potential impacts to <i>Tecticornia spp.</i>, Flora and Vegetation is considered a significant factor for the Project.</p>
	Landforms	N/A	<p>Lake Way is neither a unique nor an uncommon landform. Proposed disturbance on the lake landform will modify less than 17% of the lake surface<sup>4</sup>, including some areas previously disturbed by other mining activities or already approved as part of the demonstration plant.</p> <p>Landforms are not considered to be a significant factor associated with this referral.</p>
	Subterranean Fauna	N/A	<p>Raw water abstraction from calcretes and unconfined alluvial aquifers will occur at the West Creek and the Southern Borefield. As part of the sales agreement between Blackham and Salt Lake Potash, Blackham's existing 5C licence to abstract groundwater under the <i>Rights in Water and Irrigation Act 1914</i> for the Southern Borefield (GWL167013(3)) will be transferred to Salt Lake Potash. In addition, a 5C water licence GWL203216(2) for West Creek was granted to SO4 on the 12<sup>th</sup> August 2019.</p> <p>Both sites require SO4 to operate under approved groundwater licence operating strategies as part of the respective 5C licence conditions. These groundwater licences include drawdown limitations to minimise impacts on groundwater dependent vegetation and subterranean fauna associated with the calcrete systems.</p> <p>As the water licences associated with groundwater abstraction have been granted and incorporate relevant management measures to minimise the impact on Subterranean Fauna, this has not been considered as a significant factor associated with the implementation of the Project.</p>
	Terrestrial Fauna	N/A	<p>A Matters of National Environmental Significance (MNES) search identified a range of migratory and non-migratory species associated with the general project locality, including the Night Parrot (<i>Pezoporus occidentalis</i>) and Malleefowl (<i>Leipoa ocellata</i>) (Bamford, 2019). A</p>

<sup>4</sup> The lake surface area was calculated using the Geoscience Australia (2007) 250K topographic vector data.

Theme	Factor	Relevant Section of this Document	Comment
			<p>Night Parrot survey was completed in 2019 (Botanica, 2019a, Appendix C). This survey did not identify any night parrots within the area.</p> <p>Eleven migratory waterbirds listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) and Schedule 5 of the <i>Biodiversity Conservation Act 2016</i> are identified to occur within the Project Area; and may visit Lake Way when conditions are suitable (e.g. after heavy rain) (Bamford, 2019). As these conditions are infrequent and irregular, and the project disturbance to the Lake is less than 17% (when combined with the demonstration plant), the impact of the development to these species is unlikely to be significant.</p> <p>Surveys and monitoring of the macroinvertebrate fauna have been undertaken over Lake Way by a range of consultants, with the last survey being completed by Focused Vision Consulting in 2017. Salt Lake Potash engaged Bennelongia to complete a desktop assessment of Lake Invertebrates with consideration of the Project development; this review is attached as Appendix D.</p> <p>Bennelongia identified that existing information suggests that the Lake Way Potash Project will have minimal conservation impacts on aquatic invertebrates. If changes occur to the frequency or distribution of small flood events and the duration of associated inundation (as may occur because of groundwater drawdown or surface flow into trenches) there may be loss of some habitat for the aquatic invertebrate species using the northern end of Lake Way. However, current information suggests the species are not (or are unlikely to be) restricted to Lake Way. Based on the above, impacts to Terrestrial Fauna are not considered to be a significant factor for the Project.</p>
	Terrestrial Environmental Quality	N/A	<p>The development of this project will require limited storage of dangerous or hazardous materials associated with general minesite operations (e.g. diesel fuel). Specific dangerous or hazardous materials added to the process are Sulphuric Acid (H<sub>2</sub>SO<sub>4</sub>) and Potassium Chloride (KCl); these shall be stored in accordance with the relevant management guidelines and in accordance with the <i>Dangerous Goods Safety Act 2004</i>. The subsequent product and waste is benign.</p> <p>Impacts to terrestrial environmental quality, if any, can be managed through the mining proposal administered under the <i>Mining Act 1978</i> and Dangerous Goods licensing requirements.</p> <p>Terrestrial environmental quality is not considered to be a significant factor for the Project.</p>

Theme	Factor	Relevant Section of this Document	Comment
Water	Inland Waters	5.2.3	<p>An Acid Sulphate Soils (ASS) assessment concluded that the sediments underlying the lake contain no sulphidic or sulphuric materials and/or Monosulphidic Black Ooze (MBO), and the lake system has significant buffering capacity to neutralise potential acidity (Pendragon 2019, Appendix E). Based on this, SO4 considers that there is insignificant risk of impact from the implementation of the Project.</p> <p>Surface and groundwater hydrological processes will be altered at a local scale by the Project, through the construction of infrastructure on the Lake surface and abstraction of brine from the on-lake sediments and paleochannel. Modelling completed as part of the Lake Way Demonstration Plant proposal anticipated a minor increase in overall lake water level after large (1% AEP) storm events due to the construction of on-lake infrastructure. The rise in water level has the potential to impact on fringing vegetation, in particular <i>Tecticornia</i> sp.</p> <p>To minimise any impacts, SO4 intends to develop the Project such that pond infrastructure is located on the higher ground within the lake bed, minimising restriction of flow and potential to cause water shadow.</p> <p>Inland waters is considered a significant factor for the Project with further studies currently underway to quantify significance of the Project impacts.</p>
Air	Air Quality	N/A	<p>The site is relatively remote, with the closest population centre being the town of Wiluna, approximately 25 km north of the Project.</p> <p>Dust from construction activities has the potential to occur, however will be appropriately managed through standard operating procedures.</p> <p>During operations, some dust may be generated by vehicular movements however this will be insignificant due to the small workforce and vehicle movement required.</p> <p>Very little dust will be generated by brine extraction and processing, as solar salt production is fundamentally a wet process.</p> <p>Power supply is planned through a natural gas power station. Some diesel generators will be required for remote infrastructure.</p> <p>Overall impact to air quality is insignificant, and this is not considered a significant factor for the Project.</p>
	Social Surrounds	5.2.4	<p>A number of Aboriginal Sites are known to exist in the project locality, with some intersecting the proposed Project development envelope.</p>

Theme	Factor	Relevant Section of this Document	Comment
Human Health			<p>The Project has been developed in consultation with key local stakeholders, being native title holders, pastoralists, Shire of Wiluna and owners / operators of mining tenure. Concerns raised by stakeholders to date, have been addressed and incorporated into the design of the Project.</p> <p>SO4 will continue to consult with the relevant stakeholders to optimise project layouts and minimise disturbance to Aboriginal Sites. If impacts to Aboriginal Sites are unavoidable and subject to consultation with the Native Title Group, a Ministerial consent will be sought to use the land for a purpose in accordance with Section 18 authorisation under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>Due to the sensitive nature of the Lake from a cultural and heritage perspective, Social Surrounds is considered a significant factor to this project.</p>
	Human Health	N/A	<p>The Project is relatively remote, with the closest population centre being the town of Wiluna, approximately 25 km north of the Project. The Blackham mining camp, Millbillillie and Lake Way stations are located between 15 and 25 km from the Project.</p> <p>Implementation of the project is unlikely to result in any adverse impacts on the health or amenity of the Wiluna township or outlying communities. None of the products or by-products produced by the Project are radioactive and there is no risk of exposure to radioactive products or wastes as a result of project implementation.</p> <p>The uranium content of the brine is expected to be below detection limits when extracted and the radioactivity level associated with the cumulative total of uranium over the entire life of the project is over two orders of magnitude below the amount classed as radioactive and therefore requiring a referral.</p> <p>Human Health is not considered to be a significant factor associated with the Project.</p>

## 5.2 Preliminary Assessment of Significant Environmental Factors

This section of the report provides a summary of the significant environmental factors considered for the proposal, potential impacts, relevant management actions and predicted outcomes.

The key environmental factors and specific aspects identified in tables 5.2.1-5.2.3 were assessed to be:

- **Flora and Vegetation** – specifically in relation to the potential indirect impacts to samphire (*Tecticornia*) species.
- **Inland Waters** – groundwater drawdown from brine abstraction and changes to surface water flows.
- **Social Surrounds** considering the cultural and heritage values associated with the Development Envelopes.

When developing the mitigation and management measures for this project, the following hierarchy of control was considered:

- **Avoidance:** Significant avoidance and minimisation measures have been incorporated into decision making and project design.
- **Minimisation:** Measures that minimise an impact (for example installation of drains and culverts to minimise impacts to surface water flows).
- **Reduction:** Measures that reduce or eliminate the impact of an activity (for example implementing measures to reduce dust emissions from vehicle travel on unsealed roads).
- **Correction:** Measures that correct or rectify an impact (for example via restoration, repair, or rehabilitation).
- **Compensation:** Measures to compensate for impacts from project activities (for example by replacing lost or damaged environmental components in kind or with agreed substitute resources).

The mitigation and management measures identified in this section have been included in the Environmental Management and Monitoring Plan associated with the Project (Appendix F). This plan includes monitoring programs which will be used to verify impact predictions and to check the effectiveness of the mitigation and management measures.

An adaptive management framework will exist during project implementation, and the plan will be updated as required, according to new information or changing circumstances, experiences and lessons.



### 5.2.1 Flora and Vegetation

EPA Objective: To protect flora and vegetation so that biological diversity and ecological integrity are maintained	
Legislation, policy and Guidance	<ul style="list-style-type: none"> <li>• EPA - Statement of Environmental Principles, Factors and Objectives (EPA 2018a).</li> <li>• EIA (Part IV Divisions 1 and 2) Procedures Manual 2018 (EPA 2018b).</li> <li>• EPA Factor Guideline – Flora and vegetation (EPA 2016a).</li> <li>• Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b).</li> <li>• <i>Environmental Protection Act 1986.</i></li> <li>• <i>Agriculture and Related Resources Protection Act 1976.</i></li> <li>• <i>Biosecurity and Agriculture Management Act 2007.</i></li> <li>• <i>Wildlife Conservation Act 1950.</i></li> <li>• <i>Biodiversity Conservation Act 2016.</i></li> <li>• <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).</i></li> </ul>
Receiving Environment	<ul style="list-style-type: none"> <li>• Seven broad vegetation types were identified in the Development Envelope.</li> <li>• 57% of the Development Envelope constitutes land mapped as “bare salt lake”.</li> <li>• No TECs or PECs associated with terrestrial flora are present within the Development Envelope.(Botanica 2019b).</li> <li>• No Commonwealth or State listed Threatened flora were recorded within the Development Envelope.</li> <li>• Botanica (2019, Appendix B) has completed a literature review and gap analysis associated with this proposal and identified that 16 <i>Tecticornia</i> species considered significant under EPA guidelines (2016) may occur within the Development Envelope. These include:               <ul style="list-style-type: none"> <li>○ 2 priority flora;</li> <li>○ 5 new <i>Tecticornia</i> taxa</li> <li>○ 6 potentially new <i>Tecticornia</i> taxa; and</li> <li>○ three range extension <i>Tecticornia</i> taxa.</li> </ul> </li> </ul> <p>Botanica (2019, Appendix B) noted that there has been a sufficient number of flora survey quadrats assessed at Lake Way to adequately address the species richness of <i>Tecticornia</i>. Accumulation of <i>Tecticornia</i> species will be negligible with increased sampling.</p>
Potential Impacts	<ul style="list-style-type: none"> <li>• Alteration to drainage patterns due to the construction of ponds, trenches and associated infrastructure, resulting in drainage shadow/inundation impacts on flora / vegetation.</li> <li>• Alteration to the groundwater regime due to abstraction of brine from trenches on the lake surface.</li> </ul>

**EPA Objective: To protect flora and vegetation so that biological diversity and ecological integrity are maintained**

<p>Mitigation and Management Measures</p>	<ul style="list-style-type: none"> <li>• Disturbance to native vegetation has been minimised, with the majority of the disturbance occurring on the salt flats which has minimal vegetation and the utilisation of existing infrastructure (e.g. access roads).</li> <li>• Utilisation of existing transport corridors for the siting of infrastructure for the project (e.g. pipelines and access roads).</li> <li>• Implementation of the Environmental Monitoring and Management Plan (EMMP, Appendix F), to monitor impacts associated with the development of the project. Efforts and resources are recommended to be directed towards assessing and managing potential indirect impacts of the Project on all <i>Tecticornia spp</i> rather than conducting additional targeted surveys. Proposed monitoring is described in the EMMP which has been previously provided to the EPA. Monitoring implemented under the EMMP will be undertaken to provide a greater knowledge of the species and the potential impact from the development of the proposal.</li> <li>• Preliminary flood modelling has been completed as part of the assessment of potential impacts of the Demonstration Plant Project. That work indicates a minor (~40mm) increase in flood depths in the 1% AEP event (Knight Piésold (2019). Final modelling is required to be undertaken to confirm indirect impacts of the full scale project.</li> <li>• Indirect impacts may occur to fringing vegetation (such as <i>Tecticornia spp.</i>). Groundwater modelling has been completed to ascertain the long term cone of depression associated with the brine abstraction operations. To minimise any impact to vegetation associated with the lake fringes, SO4 intends to position trenches away from the edge of the <i>Tecticornia spp.</i> habitat as far as reasonably practicable.</li> <li>• Infrastructure has been located to minimise the direct impact on the mapped <i>Tecticornia</i> habitat through clearing, with no greater than 50 ha of direct disturbance occurring (equating to 0.6% of the total mapped <i>Tecticornia</i> habitat at Lake Way).</li> <li>• Vehicles will be restricted to designated roads and tracks to minimise the potential distribution of weeds.</li> <li>• Brine pipelines will be inspected daily for leaks.</li> <li>• Dust control measures will be implemented for the project that will include, but not be limited to, minimising speed limits, use of dust suppressants to minimise dust lift-off, use of water carts and restricting works during high-wind conditions.</li> </ul>
<p>Predicted Outcome</p>	<p>Due to the limited rainfall in the Lake Way area over an extended period, clear identification of <i>Tecticornia</i> species that may potentially be impacted by the implementation of the proposal is difficult. SO4, in consultation with the EPA, has previously agreed to implement an EMMP, which will allow for collation of data on the fringing <i>Tecticornia</i> species. This approach meets the objective of the precautionary principle to minimise direct and indirect impacts to vegetation.</p>

## 5.2.2 Inland Waters

EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	
Legislation, policy and Guidance	<ul style="list-style-type: none"> <li>• EPA - Statement of Environmental Principles, Factors and Objectives (EPA 2018a).</li> <li>• Environmental Impact Assessment (EIA) (Part IV Divisions 1 and 2) Administrative Procedures 2018 (EPA 2016e).</li> <li>• EIA (Part IV Divisions 1 and 2) Procedures Manual 2018 (EPA 2018b).</li> <li>• EPA Factor Guideline - Terrestrial Environmental Quality (EPA 2016c).</li> <li>• <i>Environmental Protection Act 1986</i> (Part V - Works Approvals and Licencing).</li> <li>• EPA Factor Guideline – Inland Waters (EPA 2018c).</li> <li>• <i>Rights in Water and Irrigation Act 1914</i>.</li> <li>• <i>Country Areas Water Supply Act 1947</i>.</li> <li>• Policies for the take and use of water (DWER).</li> <li>• Policies for better understanding water resources and planning for their use (DWER).</li> <li>• Western Australia Water in Mining Guideline (DWER 2013).</li> </ul>
Receiving Environment	<p><b>Lake Water Quality</b></p> <ul style="list-style-type: none"> <li>• The quality of water ponding on the lake is influenced by the salt crust that covers the lake.</li> <li>• Except for brief periods after large rainfall events, water ponded on the lake is typically hyper saline (&gt;200,000 mg/L TDS).</li> <li>• Brine beneath Lake Way is hypersaline (ten times as saline as seawater).</li> </ul> <p><b>Surface Water Hydrology</b></p> <ul style="list-style-type: none"> <li>• Lake Way is primarily dry except during wet periods with large runoff and/or when cyclones cause extensive rainfall-runoff.</li> <li>• The lake receives episodic surface water inflows from creeks in the north and smaller creeks along the western and south-western perimeter of the lake.</li> <li>• The northern part of the lake exhibits morphology typical of significant surface water influence and periodic inundation (smooth lake edges and island).</li> <li>• The Lake Way catchment is 11,000 km<sup>2</sup> in extent. The average annual modelled run-off to the lake is 38 GLpa but this is highly variable.</li> <li>• The Water Observations from Space data for Lake Way indicates distinct high (&gt;20%) and low (&lt;5%) frequency of flooding regions attributed to minor changes in topography.</li> </ul> <p><b>Ground Water</b></p> <ul style="list-style-type: none"> <li>• Materials at the site comprise evaporite salts (up to 50 mm thick) blanketing upper lakebed sand, silt and clay sequences, aeolian silts and sands and alluvial/lacustrine sediments, underlain by weathered basement/basalt.</li> <li>• The average water (brine) depth beneath the lake surface pits ranges between 0.3 m and 0.5 m. The thickness of the brine resource is defined by the depth to the base of the lakebed sediments which varies between</li> </ul>

<b>EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.</b>	
	<p>6.7 m and 34.6 m below ground level; the resource is generally thinner in the north, thickening to the south and east.</p> <ul style="list-style-type: none"> <li>The lake sediments are recharged by infiltration of surface run-off from the surrounding catchment (on average 38 GLpa) and direct rainfall.</li> </ul>
Potential Impacts	<p><b>Surface Water</b></p> <ul style="list-style-type: none"> <li>Alteration of drainage patterns causing water shadow and inundation.</li> </ul> <p><b>Ground Water</b></p> <ul style="list-style-type: none"> <li>Alteration to the groundwater regime due to abstraction of saline water from trenches.</li> </ul>
Mitigation and Management Measures	<ul style="list-style-type: none"> <li>Trenches will be located away from the lake fringes as far as practicable.</li> <li>Flow meters will be fitted to groundwater abstraction pipelines to facilitate monitoring of abstraction volumes.</li> <li>On lake roads and access tracks will be constructed with appropriate surface water drainage measures to minimise impacts on lake surface water flows.</li> <li>Where necessary, suitable floodways, drains and culverts will be installed to transfer flow past infrastructure and return it to its natural flow path.</li> <li>Ponds will be designed and constructed to minimise seepage.</li> <li>Diversion bunds will divert surface water around infrastructure.</li> <li>Pond infrastructure is located on the higher ground within the lake bed, minimising restriction of flow and potential to cause water shadow.</li> </ul>
Predicted Outcome	<p>SO4 considers that the potential impacts to hydrological processes within the Development Envelope will be adequately managed such that the EPA's environmental objectives will be met.</p> <p>Surface water within the Development Envelope is ephemeral in nature and is typically hypersaline. Project design has considered flow volumes, velocity and direction and will not significantly affect downstream environmental values given the location of project infrastructure and the size of Lake Way.</p> <p>Predicted outcomes will be assessed following further detailed studies.</p>

### 5.2.3 Social Surroundings

EPA Objective: To protect social surroundings from significant harm	
Legislation, policy and Guidance	<ul style="list-style-type: none"> <li>• <i>Aboriginal Heritage Act 1972.</i></li> <li>• EPA - Statement of Environmental Principles, Factors and Objectives (EPA 2018a).</li> <li>• Environmental Impact Assessment (EIA) (Part IV Divisions 1 and 2) Administrative Procedures 2018 (EPA 2016e).</li> <li>• EIA (Part IV Divisions 1 and 2) Procedures Manual 2018 (EPA 2018b).</li> <li>• EPA Factor Guideline – Social Surroundings (EPA 2016d).</li> <li>• <i>Environmental Protection Act 1986</i> (Part V – Works Approvals and Licensing).</li> <li>• National Environmental Protection (Ambient Air Quality) Measures (NEPM 2015).</li> <li>• Environmental Protection (Noise) Regulations 1997.</li> <li>• Department of Planning, Lands and Heritage - Aboriginal Heritage Act Due Diligence Guidelines 2013.</li> </ul>
Receiving Environment	<ul style="list-style-type: none"> <li>• The Lake Way Potash Project is situated in a remote location with the nearest population centre being the town of Wiluna some 25 km north.</li> <li>• Existing mining activities occur within the development envelope and in the near vicinity of the operations.</li> <li>• A number of Aboriginal sites exist within the general project locality.</li> </ul>
Potential Impacts	<ul style="list-style-type: none"> <li>• Disturbance to Aboriginal Sites due to the development of the Project.</li> <li>• Restricted access to areas traditional used by the traditional owners.</li> <li>• Alteration of the on lake surface.</li> <li>• Changes to the attributes of the environment which may impact on Aboriginal Sites.</li> </ul>
Mitigation and Management Measures	<ul style="list-style-type: none"> <li>• Aboriginal Sites have been identified and considered in siting project.</li> <li>• Continue to conduct heritage surveys to characterise heritage and cultural values in the proposed disturbance area.</li> <li>• Regular continued engagement with local stakeholders, including Native Title holders, pastoralists and other operators within the area.</li> <li>• Traditional owner engagement will continue on the Project layout and completion criteria, incorporating their considerations into the final landform design.</li> </ul>
Predicted Outcome	<p>The Project has been developed taking into consideration the issues and concerns raised by traditional owners, pastoralists and surrounding mining operations.</p> <p>SO4 is committed where practical to avoiding Aboriginal Sites and as part of detailed Project design will seek guidance from the relevant stakeholders to minimise interference with cultural and heritage values.</p> <p>Where the impact to Aboriginal Sites is unavoidable, a Ministerial Consent will be sought to use the Land for a Purpose in accordance with Section 18 Notice of the <i>Aboriginal Heritage Act 1972</i>.</p>

## **6 Cumulative Impact Assessment**

SO4 has designed the project in areas around existing tenure, operations and disturbances associated with open pit mining by Blackham. SO4 has also considered the social, environmental and cultural requirements to effectively minimise the impact of the Project and taken these into account through exclusion or placing infrastructure to minimise the direct and indirect impacts.

## 7 Conclusion

SO4 has identified that the key environmental factors which may be affected by project implementation are: Flora and Vegetation, Inland Waters and Social Surrounds. SO4 recognises that some further survey effort and investigations are required to minimise and manage potential adverse environmental impacts associated with the Project. Works are currently underway to complete studies to allow the assessment of potential risks associated with these factors, including an updated flood model and the implementation of the EMMP for the project. These additional works are planned to be completed by early December 2019.

Notwithstanding the requirement for some follow up studies (currently in progress), SO4 considers that there is a good deal of relevant information available to characterise the Project locality, both as a result of monitoring by long-established existing mining operators in the area and as a result of two previous assessments by EPA of proposed mining (and related activities) at Lake Way. It is unlikely that new impacts or threatening factors would be identified through the implementation of additional baseline studies. The activities proposed by SO4 comprise a simple industrial process for the purification of natural brines. The proposal presents few potential adverse environmental impacts. Accordingly, it is SO4's view that an assessment on referral information would be an appropriate level of assessment for the proposal.

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## **Appendix A: Lake Way Paleochannel Test Pumping Summary**

## **Appendix B: Lake Way *Tecticornia* Literature Review Gap Analysis**

## Appendix C: Targeted Night Parrot Survey: Lake Way

## **Appendix D: Lake Way Aquatic invertebrate Review**

## **Appendix E: Lake Way Acid Sulphate Soil Investigation**



## **Appendix F: Environmental Management and Monitoring Plan**